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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,543	04/17/2001	Douglas Richardson		5398

720 7590 11/07/2003

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EXAMINER

KIM, RICHARD H

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/835,543

Applicant(s)

RICHARDSON, DOUGLAS

Examiner

Richard Kim

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 20-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,20,21,23-29 and 31-49 is/are rejected.
- 7) ☒ Claim(s) 3,22 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(e) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 2, 4, 20, 21, 23-27, 29, 34-36 and 46-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Ao (US 6,411,753 B1).

Referring to claim 1, Ao discloses a method comprising focusing a selected input light beam on a first selected reflective optical switching element, the first selected reflective optical switching element directing the selected input light beam to a first input; selecting a second reflective optical switching elements; and varying a focus of the selected input light beam to focus the selected input light beam on the second selected reflective optical switching elements,

the second selected reflective optical element directing the selected input light beam to a second output (see Fig. 1, 2, and abstract).

Referring to claim 2, Ao discloses a method wherein the focusing comprises varying a focal length of an adaptive optical element (see abstract).

Referring to claim 4, Ao discloses a method wherein the adaptive optical element comprises a variable lens (see Fig. 2).

Referring to claim 21, Ao discloses a device comprising at least one adaptive optical element having a focal length variable over a range, the adaptive optical element located in a path of a selected input light beams (see abstract); and a plurality of selectable reflective optical elements, the selectable reflective optical elements alternatively selectable and interdisposable in the path of the selected input light beam to direct the selected input light beam to a corresponding one of a plurality of outputs (see col. 2, lines 38-46); wherein more than one of the selectable reflective optical elements are located within the range over which the adaptive optical element is capable of focusing the selected input beam (see abstract).

Referring to claim 23, Ao discloses that the adaptive optical element comprises a variable lens (see Fig. 2).

Referring to claim 25, Ao discloses an apparatus comprising a plurality of individual switchable reflective elements located to intercept an optical signal from an input channel (see col. 2, lines 37-42), the plurality of reflective elements having a plurality of selectable configurations, each of the configurations directing the optical signal to a corresponding one of the output channels (see col. 1, lines 49-55), in each of the configurations the optical signal incident on a selected one of the reflective elements (see col. 2, lines 38-46), and at least one

adjustable focus optical element in an optical path between the input channel and the plurality of reflective elements (see Fig. 2), the at least one adjustable focus optical element configured to focus the optical signal onto a currently selected one of the reflective elements (see col. 3, lines 23-24) and, upon a different one of the reflective elements becoming the currently selected one of the reflective elements, to vary a focus of the adjustable focus optical element to focus the optical signal onto the different one of the reflective elements (see col. 3, lines 23-24).

Referring to claim 26, Ao discloses an apparatus wherein each of the plurality of reflective elements corresponds to one of the plurality of output channels and in each of the configurations the selected one of the reflective elements is the reflective element corresponding to the corresponding output channel (see Fig. 1).

Referring to claim 27, Ao discloses an apparatus wherein each of the plurality of individually switchable reflective elements is movable between a reflective state and a non-reflective state (see col. 1, lines 49-55).

Referring to claim 34, Ao discloses that the input channel comprises an optical fiber (see Fig. 1, ref. 2).

Referring to claim 46, Ao discloses a method comprising actuating a reflective element corresponding to the selected input and output channels (see Fig. 1); and altering a focus of an optical signal from the selected input channel to focus the optical signal onto the actuated reflecting element (see abstract).

Referring to claim 47, Ao discloses a method wherein altering the focus of the optical signal comprises adjusting a variable focus optical element disposed in an optical path between the selected input channel and the reflective element (see Fig. 2).

Referring to claim 48, Ao discloses a method comprising focusing a selected radiation beam on a first selected reflective optical switching element; selecting a second reflecting optical switching element; and focusing the selected radiation beam on the second optical switching element (see Fig. 1).

Referring to claims 20, 24, 29, 35 and 36, Ao discloses the device previously recited. Ao further discloses an apparatus comprising a plurality of input channels wherein the plurality of individually switchable reflective elements of linear arrays of mirrors, the plurality of linear arrays including a mirror corresponding to each possible combination of one of input channels and one of the output channels (see col. 1, lines 49-44). As to the product-by-process limitation that the variable lens or the switchable reflective elements are micro-machined, it has been recognized that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product by itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior art product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), MPEP 2113.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 33, 38, 39, 40, 42, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ao.

Referring to claim 38, Ao discloses a device comprising a plurality of optical input channels and a plurality of optical output channels (see Fig. 1, ref. 2, 7); a plurality of individually switchable reflective elements each of which is switchable between a reflecting state and a non-reflecting state (see Fig. 1, ref. 9); and an adjustable focus optical elements, the adjustable focus optical element in an optical path between a corresponding one of the input optical channels and the plurality of individually switch reflective elements (see Fig. 2), the adjustable focus optical element capable of focusing an optical signal into a corresponding one of the input channels onto any one of a plurality of the plurality of individually switchable reflective elements located to require a different focus setting of the adjustable focus optical element (see abstract); wherein the optical signal may be directed from a selected one of the input optical channels to a selected one of the output optical channels by switching a selected one of the plurality of reflective elements to its reflecting state and adjusting a focus of the at least one adjustable focus optical elements corresponding to the selected input optical channel to focus the optical signal onto the selected reflective element (see col. 1, lines 40-62). However, the reference does not disclose a plurality of adjustable focus optical elements.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a plurality of adjustable focus optical elements since Applicant has not disclosed that employing a plurality of adjustable focus optical elements provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in

the art, furthermore, would have expected Applicant's invention to perform equally well with the focusing element disclosed in Ao in order to adjustably focus each focusing element corresponding to an input channel to improve the coupling efficiency of the device (see abstract).

Referring to claim 39, Ao discloses a method comprising actuating a reflective element to direct an optical signal from an input channel to a selected one of an output channels; and operating an adjustable focus element to focus the optical signal from the input channel onto the reflective element (see abstract).

Referring to claim 40, Ao discloses an apparatus wherein each of the plurality of individually switchable reflective elements is movable between a reflective state and a non-reflective state (see col. 1, lines 49-55).

Referring to claim 44, Ao discloses a method comprising deactivating the reflective element and activating a different reflective element; and adjusting the adjustable focus optical element to focus the optical signal onto the different reflective element (see col. 2, lines 50-55).

Referring to claim 45, Ao discloses an apparatus wherein each of the plurality of individually switchable reflective elements is movable between a reflective state and a non-reflective state (see col. 1, lines 49-55).

Referring to claim 33, Ao discloses the apparatus previously recited. However, the reference does not disclose a collimating lens disposed between the input channel and the at least one adjustable focus optical element.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a collimating lens disposed between the input channel and the at least one adjustable focus optical element since it has been held that rearranging parts of an



invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. Whether the collimating lens is disposed before the focusing element or after, both arrangements allow for collimation of the light beam.

Referring to claim 42, As to the product-by-process limitation that the reflective elements are micro-machined, it has been recognized that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product by itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior art product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). MPEP 2113.

5. Claims 28, 31, 41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ao in view of Briggs (US 6,493,479 B1).

Referring to claim 28 and 41, Ao discloses the device and method previously recited. However, the reference does not disclose that each of the plurality of individually switchable reflective elements comprises a member movable between a substantially flat orientation and a substantially upright orientation and when the reflective element is in its reflective state, the elements is substantially upright.

Briggs discloses a device wherein each of the plurality of individually switchable reflective elements comprises a member movable between a substantially flat orientation and a

substantially upright orientation and when the reflective element is in its reflective state, the elements is substantially upright (see Fig. 2a, b).

It would have been obvious to one having ordinary skill in the art at the time the invention was made for each of the plurality of individually switchable reflective elements comprise a member movable between a substantially flat orientation and a substantially upright orientation and when the reflective element is in its reflective state, the elements is substantially upright in order to achieve greater reliability (see col. 5, lines 55-56).

Referring to claims 31 and 43, Ao discloses the device and method previously recited. However, the reference does not disclose a plurality of second adjustable focus optical elements each located in an optical path between the plurality of reflective elements and a corresponding one of the output channels.

Briggs discloses a plurality of focus optical elements each located in an optical path between the plurality of reflective elements and a corresponding one of the output channels (see Fig. 1, ref. 104).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a plurality of second adjustable focus optical elements each located in an optical path between the plurality of reflective elements and a corresponding one of the output channels in order to minimize coupling loss between the reflective element and the output fiber. Moreover, it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

6. Claims 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ao and Briggs, in view of Little et al. (US 6,396,976 B1).

Referring to claims 32, Ao and Briggs disclose the device previously recited. However, the reference does not disclose that the device comprising a plurality of collimating lenses, each of the collimating lenses disposed in an optical path between one of the plurality of second adjustable focus optical elements and a corresponding output channel.

Little et al. discloses collimating lenses, each of the collimating lenses disposed in an optical path between one of the plurality reflective elements and an output channel (see Fig. 1, ref. 22).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a plurality of collimating lenses, each of the collimating lenses disposed in an optical path between one of the plurality of second adjustable focus optical elements and a corresponding output channel in order to collimate the light beam therefore reducing the output coupling loss.

7. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ao et al. in view of Winarski et al. (US 6,317,190 B1).

Ao discloses the device previously recited. However, Ao does not disclose that the adjustable focus optical element comprises a liquid crystal lens.

Winarski et al. discloses an adjustable focus optical element comprising a liquid crystal lens (see abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the adjustable focus optical element comprise a liquid crystal lens since one would be motivated to maximize the range of adjustability of the device. According to Winarski et al., such a lens provides "greater focal length range", thereby improving the versatility of the device.

***Allowable Subject Matter***

8. Claims 3, 22 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, does not teach or disclose in light of the specification, the device and method wherein the adaptive optical element comprises a variable mirror device.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Kim whose telephone number is (703)305-4791. The examiner can normally be reached on 9:00-6:30 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703)305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Richard Kim  
Examiner  
Art Unit 2871

RHK

  
T. Chowdhury  
Primary Examiner